Remarks

35 U.S.C. § 102 Rejection of Claim

In the November 16, 2004 office action, claims 65 through 67 are rejected under 35 U.S.C. § 102 (b) as being anticipated by "How to sort out the premium drivers of post - deal value" by Daniel W Bielinski (hereinafter Bielinski). MPEP § 2131 provides that:

> "A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference."

The Applicant traverses all U.S.C. § 102 (b) rejections based on Bielinski by noting that the cited reference fails to disclose or anticipate elements cited in each of the referenced claims in the instant application. As a result, the 102 (b) rejections are improper as detailed in the Table below.

65. (new) An enterprise modeling method, comprising: aggregating enterprise transaction data from one or more enterprise management systems in accordance with a common data dictionary, analyzing at least a portion of the data to identify value drivers and create summaries of element impact on aspects of enterprise financial performance using said value drivers with algorithms selected from the group consisting of entropy minimization, LaGrange and path analysis, and using said impact summaries to create network models of one or more aspects of enterprise financial performance that can be optimized.
66. (new) The method of claim 65 where the aspects of enterprise financial performance are selected from the group consisting of revenue, expense, capital change, cash flow, market sentiment value, market value, intellectual capital value, current operation value and combinations thereof.
67. (new) The method of claim 65 where the elements of value are selected from the group consisting of brands, customers, customer relationships, employees, intellectual capital, partnerships, production equipment, vendors, vendor relationships and combinations thereof.
Cited reference: Many m & a professionals use a variety of computerized models to

estimate the value of a company and guide them in setting purchase prices. However, relatively few buyers take advantage of the capabilities of these models to enhance their due diligence and formulate strategies for increasing the cash flow and enhancing the value of their acquired targets. Even fewer sellers use these models to help maximize the cash flows and values of their companies before putting their firms up for sale. Utilizing valuation tools solely to price companies is not unlike using a Ferrari to drive only to and from work - a legitimate but limited use that ignores powerful potential. Indeed, as the art of modeling has progressed, new methodologies have been developed and applied to actual transactions in the m & a market to sharply widen the utility and versatility of computer-based valuation approaches.

One particularly appealing advancement is Value-Based Management (VBM), which keys on a targets historical operations rather than future projections. VBM also can calculate the results of trade-offs when decision makers must choose between a series of factors that can be changed to enhance post acquisition value.

Probably the best-known valuation tool designed to facilitate value creation and cash flow enhancement is Shareholder Value Analysis (SVA), introduced in the 1980s by Prof. Alfred Rappaport of Northwestern University. SVA may be defined as a two-step process. First, a discounted cash flow business valuation is performed. A projection of future cash flow (including a residual) is developed and discounted at an appropriate rate, usually the cost of capital, to arrive at an indicated value. Second, key factors (or value drivers), such as growth, profit margins, etc., are varied systematically to test the sensitivity of the indicated business value to each driver. Standard SVA sensitivity analysis changes each value driver plus or minus 1%, although analysts now often use "relevant ranges" and different percentages for upside and downside swings to reflect prevailing business realities.

SVA is a useful methodology, but, as with any tool, it has limitations. In working with middle - market companies, we have found that these limitations often are magnified into constraints that necessitate modifying standard SVA analysis. VBM, a first cousin to SVA, has resulted from these modifications and already has helped a number of middle-market companies improve their cash flows and values. The same techniques should prove useful to larger companies as well.

This article provides an abbreviated overview of VBM, describes how it differs from the traditional SVA framework, provides a simplified example, and discusses several applications in the m & a arena.

Although SVA has been in use for more than a decade, many executives still are leery of recommendations based on models that utilize projections, particularly when significant changes are suggested. Their argument is that when it's hard to predict results in the next quarter, how prudent is it to change a company's strategic direction based on a five-year projection?

Rather than use projections of future cash flow like SVA, the VBM framework utilizes historical cash flow. Five years of historical cash flow are added up to arrive at a cumulative baseline cash flow number. That is in contrast to SVA's method of discounting future cash flows to reach an indicated value.

Instead of testing the sensitivity of a value based on a projection, VBM tests the sensitivity of the historical cash flow. VBM tells the executive how much more or less cash flow would be in the bank today if certain events had occurred differently or if the company had

operated differently in the past five years.

The use of actual historical data, rather than projections, has proven useful in testing the impact of alternative scenarios against the reality of actual events. It also has served as a catalyst to identify and implement actions that generate improvements. As long as a company's fundamental structure does not change going forward, the results provide meaningful insight regarding the probable outcomes of future strategic action. to the extent that risk is not increased, an executive may reasonably assume that an increase from historical cash flow trends likely would translate into enhanced value.

In the minds of some executives, particularly those with operations backgrounds, the traditional SVA "value drivers" are too far removed from daily operations to be relevant for short-term or medium-term planning. Therefore, VBM utilizes drivers that are more directly linked to operations. For example, rather than use operating profit margin as a broad value driver, a VBM analysis on a manufacturer would include a breakdown of cost of goods sold by key components. A probable mix would include:

Materials -- The cost of raw materials and purchased components used in production, net of scrap sales.

Human Resources - All direct and indirect labor costs, fully loaded with all benefits - regardless of where the accountants might classify them, i.e., in "General and Administrative" expense - to get a true picture of manufacturing labor cost.

Technology / Capital - All costs associated with running and maintaining the manufacturing facilities and equipment (rent, depreciation, etc.) and R&D.

Other Cost of Goods Sold -- Such as utilities, etc.

Compartmentalizing the costs allows managers to link strategy with pure day-to-day operating factors, such as scrap rates, procurement procedures, pricing policies, etc. Much has been written about "linking" manufacturing operations to strategy as a means of establishing competitive advantage. VBM facilitates this process.

Traditional SVA assesses changes in one value driver at a time. But many strategic decision involve trade-offs, resulting in two or more value drivers changing simultaneously. The pressure on decision makers in those situations often is to concentrate change in the drivers that are assumed to offer the greatest enhancements in overall business value, even if such a focus in actuality works to the detriment of cash flow and value.

For example, a company might pursue lower-margin commodity business in order to grow by expanding the top line. Executives will be trading off profit margin for growth. But that's just for openers. A higher-growth game plan could necessitate increased capital expenditures -- to improve efficiency, increase production, or boost productivity

So these additional costs must be incorporated in the decision. Since the net effect of such trade-of cannot be gleaned by simply "netting" the results of single-variable sensitivities, a model that can sort out concurrent changes in several value drivers can provide crucial information for an intelligent decision based on all relevant factors.

In the final analysis, VBM essentially utilizes SVA principles but advances the basic techniques by incorporating historical data, operations-linked value drivers, and concurrent

changes in multiple value-drivers. So how does a VBM analysis look?

Table 1 shows a reconstructed historical operating cash flow statement for an actual company, using disguised data. (Table 1 omitted As with traditional SVA, operating cash flows, which exclude interest expense and debt changes, are measured. Note the operations breakout - showing that fully loaded labor is the largest single cost, materials is second, and other costs are relatively small contributors - to determine the cost of goods sold. The ability to partition manufacturing costs in this manner is important to strategic decision-making. For example, while fully loaded human resources cost is about 33% of sales in Table 1. direct labor costs for the company were only 7%. This insight alone was an eye-opener for management.

The bottom-line operating cash flows for the five-year span are added up to produce a "total cumulative cash flow" of $1,174,000. This represents a baseline cash now number that can be used in conjunction with sensitivity analysis to determine exactly what factors really "drive" the company's cash flow and value.

Table 2 shows the sensitivity of the baseline cash flow to changes in key factors. (Table 2 omitted In other words, it demonstrates how the results might have turned out differently had operating or strategic changes been effected in the recent past. In turn, this suggests improvements that can be made in the future.

For example, a 5% annual increase in sales, while holding relative cost relationships constant, would have dramatically expanded cash flow by 84%. But such growth may be far more difficult to achieve than improving the productivity of operations. Thus, the sensitivity analysis also shows how changes in key cost and operating components can impact cash flow.

By comparing Tables 1 and 2, the analyst can determine which drivers can, if altered, impact cash flow the most. One striking conclusion is that the areas 'Where the big dollars are" do not always offer the greatest opportunities to improve cash flow and value. At our example company, Table I has established, human resources represent the largest component of cost of goods sold, suggesting that it is a labor-intensive operation.

working on fully loaded labor costs would not be unproductive. For a 11% cut, cumulative cash flow will expand by 7%. Moreover, the consequences of not controlling labor costs are dire, since the same 7-to-1 ratio works in reverse as a 10% rise in human resources costs chops cumulative cash flow by 70%. but the cash flow harvest is not as rich as in curbing material costs, where a 5% reduction will expand cumulative cash flow by 25%. Further, efforts to cut material costs often require less energy than a attack on labor costs, because many firms have tried to bleed every last dollar out of labor cost while ignoring material cost drivers like scrap and procurement.

With these data in hand, strategic changes now may be directly linked to manufacturing. Initiatives to control material costs, for example, might include standardizing or high unit cost/lower total cost through reduced scrap, eliminating overspecificabon on parts orders to vendors, and establishing better value chain management through closer relationships with suppliers. Reducing scrap or increasing growth may now be related directly to reducing setup times, streamlining the factory, shortening production runs, increasing manufacturing flexibility, and other factory floor initiatives that impact costs, pricing, and competitive advantage.

Table 3 presents certain "bread-even trade-off," or how changes in two value drivers can offset each other and leave the baseline cash flow unchanged. (Table 3 omitted) Strategies can be evaluated in light of these trade-offs.

Complex modeling, varying three or more value drivers concurrently, is also possible. For example, our company in Table I may mount a strategy to enhance sales growth 5% a year by pursuing lower-margin business. Reaching the sales goal requires cutting gross margin 2%, stocking more product in inventory - thereby reducing turnover by two turns – and channeling an additional $50,000 a year into capital outlays. Unless there is an overwhelming competitive reason for a pure sales-growth strategy, the approach is self-defeating from a value standpoint. It would reduce historical cumulative cash flowby about 10%.
The Table 1 example utilized a manufacturer. While the value drivers used for, say. a distributor would be different, the same sorts of linkages to operations can he developed.

This framework offers multiple applications or corporate acquirers. Prior to an acquisition, the VBM model can help identify hidden potential for quick cash flow generation - which is especially important for dealmakers in leveraged transactions. VBM has been used with great effectiveness in the due diligence process to evaluate risk. And postacquisition strategy formulation for the target also may include a VBM analysis.

Before making an acquisition, a company can derive great benefit from a VBM-based self-evaluation designed to identify strengths and weaknesses of its existing operations and strategies. It is a sad fact that many companies undertake acquisitions in an attempt to fix internal problems that they have not effectively addressed on their own. Invariably, they aggravate the problems by repeating the same mistakes on the targets they acquire and making both worse.

At a minimum, a VBM analysis night revel upside potential a buyer could "acquire into," or dowside risk that could be diversified away through acquisition. For example, a company that faces hill downside risk if its growth slows might acquire a slow- growth, stable company to reduce the damage should the combined company not hit its growth targets

A related but much broader issue critical to both corporate acquirers and dealmakers involves the design of incentive compensation plans. Traditional incentive plans tend to be fired to accounting-based earnings measures that may not be the best gauges of value change. More recently, incentive plans bed to cash flow, the same basic yardstick used to measure value, have grown in popularity. However, there are two major difficulties in implementing a value-based incentive compensation plan - it uses a projection that is generated by management, which means that it may be perceived by plan participants as self-serving, and there are problems in tying incentive plans to operations.

VBM addresses both of these concerns and offers the advantage of focusing on increments to value, rather than a single value for a company. The benefits of an incentive compensation plan for target management that is bed to value creation are compelling for the acquirer who is anxious to reap the greatest payoff from the combined organization.

On the other side, a potential seller can use VBM to "dress up" the business from a valuation standpoint before putting the company in play. Preferably, enhancement efforts should start three to five years prior to sale. This is especially important in the current m & a market where the seller gets paid more for demonstrated results than for great potential

Further. some potential sellers are looking to "get out from under" problems that seem unsolvable. VBM can be used to help get a handle on the company's performance and identify areas that can be improved under the present ownership. The exercise may lead the seller to conclude that the resulting cash flow and value benefits make the company worth keeping.

VBM also can be used to add credibility to a seller's projection of sales, earnings, and cash flows. A projection that has the same sensitivity profile as the historical performance enjoys greater believability. If projected cash flow improvements are similar in magnitude to improvements that could have been achieved historically, the forecast is more readily accepted by the buyer. And if both the acquirer and target utilize VBM in constructing a projection, the two sides might come close to reaching a consensus on what constitutes a "realistic" projection of future performance.

The valuation concepts and models that are so critical to effective pricing of companies enjoy much wider versatility than their most common uses. They can be sensibly employed to evaluate other key factors such as risk assessment and ongoing value creation that can make the difference between a success or a failure in an acquisition. They offer potential buyers and sellers powerful tools that might give them a competitive edge in the m & a arena.

Value-Based Management (VBM) represents one of the latest advancements in Discounted Cash Flow (DCF) modeling that is available to acquirers. VBM centers on what specific steps can be taken operationally and strategically to add value to a target after the deal is signed. It is based on the targets historical performance, rather than projections, and can show how the record might have been changed had managerial decisions and operating environments been different.

Sensitivity analysis of past results offers clues to what can be done in the future and which value drives - e.g., sales growth, profit margins, productivity, etc. -- should receive the most attention to achieve the optimal rewards.

Additionally, the VBM technique allows the analyst to figure key decisionmaking trade-offs, since attention to one driver may generate negative effects on others or two or more drivers may have to be varied in concert to produce the best results.

What's missing from Claim 65:

1) aggregating enterprise transaction data from one or more enterprise management systems in accordance with a common data dictionary,
2) analyzing at least a portion of the data to identify value drivers and create summaries of element impact on aspects of enterprise financial performance using said value drivers with algorithms selected from the group consisting of entropy minimization, LaGrange and path analysis, and
3) using said impact summaries to create network models of one or more aspects of enterprise financial performance that can be optimized.

What's missing for claim 66:

1) See what's missing for claim 65, and
2) Market sentiment value, intellectual capital value, current operation value are not described or anticipated

What's missing for claim 67: 1) See what's missing for claim 65, and 2) brands, customers, customer relationships, employees, intellectual capital, partnerships, production equipment, vendors, vendor relationships and combinations thereof are not described or anticipated.
Objection: The Applicant objects to the statements used to support these rejections because they do not appear to be supported by the cited reference.
Conclusion: One or more elements of claims 65, claim 66 and claim 67 are not described or anticipated by Bielinski.

The office action discussion of claim 65 supplements the evidence detailed above with a comment that "no patentable weight is given the claim "to identify value drivers and create summaries of element impact... since is just intended use. There is no method claim recites that indicate value drivers were identified and summary was created." This comment is traversed by noting that: the cited excerpt is just part of claim 65, that claim 65 is a valid method claim, that the Office Action contains no evidence to support the comment as required by the Administrative Procedures Act and that there is no statutory basis for an alleged "patentable weight" for a portion of a claim being used as a consideration in the evaluation of a claim.

The Applicant notes that Bielinski advocates the use of Value Based Management (VBM) and VBM teaches away from the method of the instant application (as detailed in claims 35 – 68) in a number of ways. Taken together with the prior art presented in the 5 May 2004 office action, there are now over 30 documented ways in which the references presented as prior art teach away from the method of the instant application. The Applicant notes that there still other ways in which the § 102 rejections for claims 65 – 67 can be traversed.

In the November 16, 2004 office action, claims 68 is rejected under 35 U.S.C. § 102 (b) as being anticipated by Bielinski. MPEP § 2131 provides that:

> "A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference."

The Applicant traverses all U.S.C. § 102 (b) rejections based on Bielinski by noting that the cited reference fails to disclose or anticipate elements cited in each of the referenced claims in the instant application. As a result, the 102 (b) rejections are improper as detailed in the Table below.

68. (new) A system for valuing elements of value on the basis of their impact on aspects of enterprise financial performance where the elements of value are selected from the group consisting of brands, customers, customer relationships, employees, intellectual capital, partnerships, production equipment, vendors, vendor relationships and combinations thereof, where the impact of an element of value on an aspect of enterprise financial performance is determined by an analysis of transactions and is net of its impact on other elements of value, and where the aspects of enterprise financial performance are selected from the group consisting of revenue, expense, capital change, cash flow, market sentiment value, market value, intellectual capital value, current operation value and combinations thereof.
Cited references: See cited references for claims 65, 66 and 67
What's missing: 1) a system for valuing elements of value on the basis of their impact on aspects of enterprise financial performance 2) where elements of value are selected from the group consisting of brands, customers, customer relationships, employees, intellectual capital, partnerships, production equipment, vendors, vendor relationships and combinations thereof, 3) where the impact of an element of value on an aspect of enterprise financial performance is determined by an analysis of transactions and is net of its impact on other elements of value, and 4) where the aspects of enterprise financial performance are selected from the group consisting of market sentiment value, market value, intellectual capital value, current operation value and combinations thereof.
Objection: The Applicant objects to the statements used to support this rejection because they do not appear to be supported by the cited reference.
Conclusion: One or more elements of claims 68 are not described or anticipated by Bielinski.

The Applicant notes that there still other ways in which the § 102 rejection for claims 68 can be traversed.

35 U.S.C. § 103 Rejection of Claims

In the 16 November 2004 office action, claims 35 - 64 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Bielinski in view "Neural networks enter the world of management accounting" by Brown, Carol E. Coakley, James, Phillips, Mary Ellen, Management Accounting, Montvale, May 1995 (hereinafter Brown).

The Applicant traverses all § 103 rejections for these claims by noting that the 16 November 2004 office action fails to establish the prima facie case of obviousness required to sustain a § 103 claim rejection. A prima facie case for obviousness requires, among other things, a combination or modification of references that would make the invention obvious and a suggestion to combine or modify the references. More specifically, MPEP § 2143.01 provides:

> The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

The Applicant will detail two distinct ways in which the 16 November 2004 office action fails to establish a prima facie case of obviousness while noting that there are several other ways in which all § 103 rejections can be traversed. One of the ways in which the 16 November 2004 office action fails to establish a prima facie case of obviousness is that the Examiner has not provided references that can be combined or modified to describe, anticipate or make obvious a single claim. A review of claims 35 through 64 will illustrate this point.

35. (new) An element impact summary method, comprising:

aggregating enterprise related transaction data from one or more enterprise management systems by element of value in accordance with a common data dictionary;

creating performance indicators for each element of value using at least a portion of the data,

training neural network models of historical and forecast data for one or more aspects of financial performance using said indicators to identify value driver candidates by element of value,

analyzing historical and forecast data for one or more aspects of financial performance using induction algorithms and said value driver candidates to identify value drivers and create element impact summaries where said element impact summaries are useful in analyzing, modeling and optimizing aspects of enterprise financial performance and completing element valuations.

Cited references: See cited references for claims 65, 66 and 67 and

Financial managers must keep up with this new realm of artificial intelligence, which is changing the way financial transactions are handled. When artificial intelligence techniques are applied to the area of expert problem solving, the result often is called an expert system. Expert systems are used for tasks ranging from credit approval to preparation of comprehensive personal financial plans. Financial applications are the most frequent use of expert system technology. Expert system developers are welcomed into these markets where they are altering the financial services industry's competitive mix by fostering new services and instruments while supporting basic data processing.

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The next revolution is not coming - it is here! Just as the information highway has revolutionized the way we access, use, and store information, artificial intelligence (AI) is changing the way we practice accounting and structure internal controls.

Artificial intelligence is the study of how to make computers do things that people do better now. It has its roots in theorem proving, game playing, and general problem solving. As Figure 1 suggests, artificial intelligence is being used to address a wide range of areas that have resisted automaton with conventional methodologies. (Figure 1 omitted) These areas include formal tasks like mathematics and games; everyday, mundane tasks that most people do easily, like seeing, hearing, and using natural language; and tasks usually left to experts, like medical diagnosis and financial analysis.

AI is implemented in practice with a set of powerful tools and methodologies. Three of the most common methods parallel the way people reason: rules (inference procedures), cases (case-based reasoning), and pattern matching (neural networks). These methods may be used separately or in combination and currently are being used to solve a variety of business tasks.

WHAT ARE EXPERT SYSTEMS?
When artificial intelligence techniques are applied to the area of expert problem solving, the result often is called an expert system. Rule-based procedures were the first to be applied successfully to solve problems previously done by experts. The term expert system was coined to refer to those systems. Early expert system definitions focused on rule based methodologies.

Not all people use the term expert system in the same way. Some people still require that the systems be rule based, while others now include systems based on case-based reasoning and neural networks as well. Some people require expert systems to perform as well as the best experts, while others include systems that act as intelligent assistants. Some people require that expert systems use artificial intelligence techniques. Others use the term "expert system" for all systems that function in an expert domain whether they use artificial intelligence techniques or not. Explaining why something should not be considered artificial intelligence is easy; explaining why it should be is difficult.

The following trends are occurring and will continue to occur:

More businesses are learning about, experimenting with, and developing applications using artificial intelligence techniques to solve problems previously requiring human experts;

Artificial intelligence techniques are being integrated with "traditional" data processing technology;

Systems using artificial intelligence techniques are being targeted for the mass market in addition to applications developed for a specific company;

Neural networks will enhance this growth.

Expert systems are used for tasks ranging from credit approval to preparation of comprehensive personal financial plans. Financial applications are the most frequent use of expert system technology. Expert system developers are welcomed into these markets where they are altering the financial services industry's competitive mix by fostering new services and instruments while supporting basic data processing.

Expertise Available. Expert system task domains require substantial specialized knowledge. For a rule-based system, the experts must communicate their expertise as rules. The expert's ability to select similar cases and to use analogy to solve cases is critical for case-based systems. For neural networks, the expert must select the facts and variables that are important to consider, and sufficient data must be available to train the network. Like human experts, expert systems make mistakes, so some percentage of incorrect or nonoptimal solutions should be acceptable if the technology is used.

Matching the Technology with the Task. Rule-based technology is based on symbolic reasoning, so it works well for tasks based on applying rules, such as those in the tax and audit domains. Case-based systems reason by analogy, so they are effective for help desks. Neural networks use pattern matching. The financial services industry with its large databases has fielded several successful neural network applications, and neural networks based on information about customers or potential customers have proved effective, In fraud detection, they are integrated effectively into expert systems. If large databases exist with which to train a neural network, then use of that technology should be considered. For a neural network the large database can be used as the equivalent of the human expert

Each type of reasoning can be matched to tasks that require its specific reasoning strengths.

Experience with the Technology for the Task. Available information about current systems does not tell us which expert system tool to use to do a specific task. Most deployed systems are rule-based, but that fact does not suggest that rule-based technology is the most appropriate for all tasks-just that it has been in use the longest. As more applications employ a particular technology in a particular application area, using that technology becomes less risky.

Michael Hutson at General Motors Acceptance Corporation (GMAC) says management may be reluctant to deploy a system using newer, unproven technologies for tasks that are critical to the business. A simple rule is: An unproven technology requires more management commitment. Developers should focus on either creating a system using known technology or advancing technology but not both simultaneously. For example, in 1987, after less than two years of development, GMAC deployed its first credit system using established rule-based technology. That same year, GMAC began to experiment with neural networks. But the neural networks were not deployed until 1992. In the end, the neural network technology was successful for GMAC, but the development time and the lag before deployment were much longer than for the more established rule-based technology. Addressing all management's concerns about neural network technology, including the legal ramifications, took almost two years.

Importance of Explanation. The lack of causal explanation in neural networks makes some developers reluctant to use it. For example, Park City Group, the developer of PaperLess Management, a set of 25 expert systems for managing a multilocation retail business, has experimented with neural networks but has chosen not to use them for this reason. Another developer, Stotler, Henke Associates, Inc., considered all three technologies for its sales forecasting system, Retail Sales Prediction. It rejected rule-based reasoning because of the complexity of the rules required and neural network technology because of the need to explain the predictions to store managers. The firm chose case-based reasoning because it provided good predictions with little development effort and a way of explaining the prediction to the store managers.

Learning. Human experts automatically adapt to changing environments, but rule-based expert systems must be updated explicitly. This lack of ability to adapt to change automatically is one of the drawbacks of rule-based systems. Case-based reasoning systems can update the case base automatically, and neural networks can be retrained automatically as new data become available. For tasks requiring frequent updates of data, case-based reasoning and neural networks have a significant advantage over rule-based systems.

NEURAL NETWORK SYSTEMS IN USE

Many credit approval expert systems employ neural network technology. Neural networks also are used to determine compliance with a bank's policies and to detect fraudulent transactions in an arena where traders make millions of dollars of trading decisions daily. Neural networks are good tools for fraud detection because of the volume of data available to create the network and the need to discover unusual or abnormal transactions. All these areas have large accessible databases of case information.

There are many other financial applications that also use neural networks. The systems usually are not discussed in the literature because of their proprietary nature. When they

are discussed, the type of expert system may not be easily discernible. Here we will show you seven examples of neural networks that companies are using today.

FORECASTING AND SCHEDULING
Neural networks are used for forecasting future sales and prices, estimating future costs, and planning future schedules and expenditures.

Airlines must schedule use of their airport gates, which changes constantly because of flight takeoff delays and late-arriving flights. Air Canada's neural network, developed using the Symbolic Spreadsheet by Texas Instruments, does its airport gate scheduling. The improved scheduling makes aircraft operations more predictable, reduces delays, and reduces fuel costs by shortening the time aircraft spend waiting for available gates. More efficient scheduling raises the number of flights by each aircraft, increases revenue, provides better management of disruptions, and improves passenger service. Air Canada anticipates expanding its system to manage adjacent ground resources such as aircraft cleaning crews, commissary, and baggage handling.

Some companies are using neural networks to find qualified customers. Churchill Systems, a provider of hospital supplies, uses a neural network to identify the key characteristics of the best customers and searches the inactive customer list for the highest probability purchasers from those who are inactive.

Neural networks also help with customer service and support. As businesses reorganize based on customer needs, neural networks can help them analyze past business transactions so they can understand their customers' buying patterns. HNC Software Inc.'s neural network for database mining has been tailored for database marketing by Custom Insight Co. Bank-tec has a neural network that reads and approves the handwritten numerals on the face of each check. The system saves the bank thousands of dollars each year.

MONITORING TRANSACTIONS FOR FRAUD
Monitoring transactions to detect fraud is an important application area. Both neural networks and rule-based systems are used for screening large numbers of similar transactions for fraud. This ability to screen all transactions is especially important in fraud prevention. Industries with large-scale fraud problems, like the credit card industry and the health insurance industry, are particularly active in developing neural networks.

The credit card industry is especially vulnerable to fraud from credit cards lost by or stolen from e card holder, cards intercepted before they reach their intended users, and counterfeit cards. Neural networks have been effective in preventing the use of these credit cards by criminals.

FALCON by HNC, Inc., is a credit card fraud prevention system used by six of the 10 largest credit card companies. Users include First Chicago; Household Credit Services, Inc.; AT&T Universal Card Services; and Visa U.S.A. The system uses primarily neural network-based technology and has some database, rule-based, and statistical modeling capabilities. It creates an individual behavior file for each account using pools of fraud data. FALCON detects patterns that may be fraudulent as it examines each transaction. When FALCON decides that fraud is likely, it provides strategies for follow-up. FALCON has been saving clients from 20% to 50% more than their existing fraud detection systems. Colonial National Bank reported that FALCON reduced losses due to non-receipt of cards and counterfeiting by as much as 50%. The processing of merchant sales drafts and payments,

however, continues to resist efforts at complete automation. HNC is looking at debit card fraud, merchant fraud, and health insurance fraud for more applications.

A few years ago a large bank experienced several million dollars in credit card losses and needed a system to fight this credit card crime. Fraud Detection System, developed by Nestor, Inc., for the bank is a mainframe-based neural network designed to control losses from credit card transactions. The system calculates the likelihood that a current transaction is fraudulent based on the card's history and various models of criminal behavior. The bank uses the system's information to notify VISA and Mastercard to either accept or deny a transaction or to request more information from the card holder. (Nestor now has introduced PRISM, for proactive fraud risk management, which operates cross-platform on mainframes, UNIX workstations, or networked PCs.)

Chase Manhattan Bank, GE Capital, and Colonial National Bank also have neural networks to fight credit card crime. Their systems sift through hundreds of thousands of credit card transactions daily and flag possible fraudulent ones. In tests run by GE Capital, its neural network detected 40% of fraudulent transactions with only a 1 % false positive.

One fraudulent transaction in foreign currency trading can cause millions of dollars in losses for a bank. One type of fraud is a trader colluding with a customer and splitting the profits. Chemical Bank needed a practical, cost effective, and powerful solution to monitoring a high-volume, high-risk business given a severe scarcity of expertise available in detecting this type of fraud.

Chemical Bank's Inspector is a neural network with some rule-based technology that monitors (audits) high-volume, high-risk foreign currency trading. It was developed using Nexpert Object by Neuron Data and ART-iM by Inference Corp. Each day the system reviews thousands of transactions around the clock and around the world that represent more than $1 billion in trades. The system produces a management alert report summarizing any unusual findings. Ten a foreign exchange manager reviews the flagged trades. The flags earmarking a fraudulent transaction are dollar volume for that type of trade, historical norms, and other trading pattern disruptions.

For proprietary reasons, the bank will not reveal the success of the system. If Inspector identifies one fraudulent transaction, however, it would pay for itself several times over. The bank's management believes the system is a powerful deterrent to fraud.; Chemical Bank's traders worldwide know all transactions are reviewed by management daily - a powerful defensive weapon. The bank's management believes the system provides a level of control and information not available previously.

INVESTMENTS (
Many systems also have been developed to help investors and investment companies manage investments in securities. Fidelity has a neural network it uses as a decision aid in stock purchases for mutual funds. The neural network makes a very accurate forecast about 10% of the time; the other 90% of the time it makes no forecast at all.

Deere & Co. uses a neural network to manage the $100 million equity portfolio of its pension fund. Forty indicators are used to rank the expected future returns of 1,000 equities. Currently owned stocks are sold and are replaced by those with future return rating over a certain cutoff, which results in an 80% monthly turnover. The portfolio return, net of transaction costs, exceeds that of the Standard & Poor's 500 index.

John W. Loofbourrow Associates, Inc., uses a PC-based neural network to predict the S & P 500 index. Shearson Lehman's neural network predicts the performance of stocks and bonds to help market traders in making their buy, hold, and sell decisions. The system recognizes patterns in market activity before they are apparent to a human, which may mean millions in trading profits. A program called Braincel from Promised Land Technologies, Inc., has been used successfully for trading 30 - year Treasury bond futures. Braincel is a neural net add-in to Excel for MS Windows. According to company owner, Stanley Dalnekoff, at the moment it is used mainly by financial forecasters trying to make their fortunes - with varying degrees of success. Dalnekoff is a Scottish Chartered Accountant and is interested in using Braincel for other financial and accounting purposes.

CREDIT GRANTING

Neural networks are valuable for credit granting. "Recent experiments testing the consistency and quality of individual loan officers' credit assessment skills show dramatic gaps and inconsistencies. Individual officers change their risk grades over time. Collectively, bank lenders fail to meet their institutions' defined acceptable standards by wide margins, especially for riskier loans." (1)

Citibank uses a neural network to process credit card applications. The system can process an application in one to five minutes instead of the previous several - day process.

American Express's Knowledge Highway is used for processing credit card applications, processing transactions, and collecting overdue accounts. The system is considered a very ambitious effort in expert system use. American Express is building a "knowledge highway" in which intelligent computers will help people with every step of the job of managing credit. The system has neural networks to evaluate credit risks via credit scoring. For overdue accounts, the computer assembles the information needed to analyze an account, reviews applicable state and national laws, generates the collection letter, files all the paperwork, and creates a reminder for the collector. The system changed the hiring from number crunchers to employees with high people skills and broadened the scope of the positions.

General Motors Acceptance Corporation (GMAC) approves credit for automobile loans with its two neural-network Credit Advisor systems. Credit Advisor is integrated into a mainframe-based consumer credit scoring application program. The neural networks evaluate credit for customers who are leasing automobiles and for customers who are buying them.

These systems fine-tune the existing credit-granting process. Management believes the ideal system should approve at least 20% of the credit applications. Before the neural networks were developed, fewer than 20% were approved. With the neural networks, 30% receive automatic approval.

About 800 car dealers use Credit Advisor to make credit decisions. GMAC has not performed a cost / benefit analysis yet because the system has not been in operation long enough for the company to learn if the credit approvals made by the system were good choices. The company has experienced savings in person hours for making credit decisions, reduced training costs, and fewer write-offs. Standardizing the credit-granting process also has reduced the effort of GMAC's internal audit staff.

Chase Manhattan Bank uses its neural network to evaluate commercial loan applications for

its $300 million annual loan business. The neural network reduces loan losses by helping assess the credit worthiness of potential borrowers. The system identifies the strengths and vulnerabilities of the borrower and forecasts the impact of those factors for three years.

PROPERTY VALUATION
HNC, Inc.'s neural network, AREAS, is a residential property valuation system. AREAS automatically provides a baseline appraisal value and explains the factors that contribute to or detract from the property value. The system includes a continuously updated database of recent sales and other data. Valuations are based on the location and physical characteristics in relation to other comparable properties.
COST ENGINEERING
A neural network that would estimate the cost of pumps using flow and head parameters was developed to demonstrate the application of neural networks to cost engineering. The author, Robert McKim, compared the results of three other methods of estimation to the neural network and concluded, "Neural networks appear to have great potential in the estimation of non-deterministic costing systems ... [and] the potential to eventually be regarded as suitable and as practical as spreadsheets are today for cost engineers."

ENSURING EMPLOYABILITY
As we have shown, neural networks are being used for a variety of financial management applications from detecting fraud to granting credit to estimating costs to planning future schedules to determining compliance with a bank's policies. But all these areas require users to have developed good technology skills. Becoming experienced as a developer and applier of new technology such as neural networks is the best way for you as a management accountant/financial manager to ensure long- run employability. If you fight technological change, the best possible outcome is only a temporary reprieve.

What's missing:

1) aggregating enterprise related transaction data from one or more enterprise management systems by element of value in accordance with a common data dictionary;
2) creating performance indicators for each element of value using at least a portion of the data,
3) training neural network models of historical and forecast data for one or more aspects of financial performance using said indicators to identify value driver candidates by element of value, and
4) analyzing historical and forecast data for one or more aspects of financial performance using induction algorithms and said value driver candidates to identify value drivers and create element impact summaries where said element impact summaries are useful in analyzing, modeling and optimizing aspects of enterprise financial performance and completing element valuations.

Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 35.

Before going on to discuss other claims it is worth noting that the Applicant objects to the statement that "Bielinski teaches aggregating enterprise related transaction data from one or more enterprise management system, creating performance indicators, analyzing historical and forecast data for aspects of financial performance using indication algorithms and value driver candidates and creating impact summaries" as it does not appear to be supported by the cited reference. The Applicant similarly objects to the statement that

"Bielinski teaches element of value selected from the group consisting of brands, customers, employees, etc.," as it does not appear to be supported by the cited reference. The Applicant also objects to the statement that "it is well known that neural network increase score prediction accuracy and enable fast, accurate score model implementation" as it does appear to be supported by the cited references and because the relevance of this statement to the claimed invention is not clear. Finally, the Applicant objects to the statements that "Bielinski teaches capital change, and logged or recorded events for transaction data" as it does not appear to be supported by the cited reference.

Because the cited combination of references can not be combined, modified or used to describe, anticipate or make obvious claim 35, they can not be combined, modified or used to describe, anticipate or make obvious any of the dependent claims associated with independent claim 35 as detailed below.

36. (new) The method of claim 35 that further comprises using the element impact summaries to create network models of one or more aspects of enterprise financial performance that can produce usable forecasts without the use of a reconciliation system.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 35, and 2) using the element impact summaries to create network models of one or more aspects of enterprise financial performance that can produce usable forecasts without the use of a reconciliation system.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 36.

37. (new) The method of claim 35 where the elements of value are selected from the group consisting of brands, customers, employees, intellectual capital, partners, vendors, vendor relationships and combinations thereof.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 35, and 2) elements of value are selected from the group consisting of brands, customers, employees, intellectual capital, partners, vendors, vendor relationships and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 37.

38. (new) The method of claim 35 where the aspects of enterprise financial performance are selected from the group consisting of revenue, expense, capital change, cash flow, market sentiment value, market value, current operation value and combinations thereof.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 35, and 2) market sentiment value, current operation value and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 38.

39. (new) The method of claim 35 where a transaction is any event that is logged or recorded.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 35, and 2) a transaction being any event that is logged or recorded.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 39.

40. (new) The method of claim 35 where the element impact summaries are comprised of indicators selected from the group consisting of numeric data, date data, trends, ratios, averages, patterns, time lagged numeric data, time lagged date data, time lagged trends, time lagged ratios, time lagged averages, time lagged patterns and combinations thereof.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 35, and 2) element impact summaries comprised of indicators selected from the group consisting of numeric data, date data, trends, ratios, averages, patterns, time lagged numeric data, time lagged date data, time lagged trends, time lagged ratios, time lagged averages, time lagged patterns and combinations thereof..
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 40.

41. (new) The method of claim 40 where the impact summary values are at least in part a function of the inter-relationship between the value drivers.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 40, and 2) impact summary values that are at least in part a function of the inter-relationship between the value drivers.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 41.

42. (new) The method of claim 35 where the induction algorithms are selected from the group consisting of entropy minimization, LaGrange and path analysis.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 35, and 2) induction algorithms selected from the group consisting of entropy minimization, LaGrange and path analysis.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 42.

43. (new) The method of claim 36 where the models of enterprise financial performance can support the optimization of enterprise financial performance.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 36, and 2) models of enterprise financial performance can support the optimization of enterprise financial performance.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 43.

44. (new) The method of claim 36 where the models of enterprise financial performance support the identification of transaction changes that will optimize performance.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 36, and 2) models of enterprise financial performance that can support the identification of transaction changes that will optimize performance.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 44.

45. (new) The method of claim 36 that further comprises using the models of enterprise financial performance to complete analyses from the group consisting of identifying changes to elements of value that will optimize one or more aspects of enterprise financial performance in an interactive manner, identifying the value impact of each element of value, identifying the impact of element of value changes on one or more aspects of enterprise financial performance in an interactive manner and combinations thereof.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 36, and 2) models of enterprise financial performance that can complete analyses from the group consisting of identifying changes to elements of value that will optimize one or more aspects of enterprise financial performance in an interactive manner, identifying

the value impact of each element of value, identifying the impact of element of value changes on one or more aspects of enterprise financial performance in an interactive manner and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 45.

46. (new) The method of claim 36 where a Markov Chain Monte Carlo model is used to identify the changes that will optimize one aspect of enterprise financial performance, genetic algorithms are used to identify changes that will optimize one or more aspects of enterprise financial performance or multi-criteria optimization models are used to identify the changes that will optimize two or more aspects of enterprise financial performance.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 36, and 2) a Markov Chain Monte Carlo model being used to identify the changes that will optimize one aspect of enterprise financial performance, genetic algorithms being used to identify changes that will optimize one or more aspects of enterprise financial performance or multi-criteria optimization models are used to identify the changes that will optimize two or more aspects of enterprise financial performance..
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 46.

47. (new) The method of claim 35 where the value driver candidates are factors that affect elements of value, intellectual capital, aspects of enterprise financial performance and combinations thereof.
Cited references: See cited references for claim 35
What's missing: 1) see what's missing from claim 35, and 2) value driver candidates are factors that affect elements of value, intellectual capital, aspects of enterprise financial performance and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 47.

48. (new) A computer readable medium having sequences of instructions stored therein, which when executed cause a processor to perform an element impact summary method, comprising:

aggregating enterprise related transaction data from one or more enterprise management systems by element of value in accordance with a common data dictionary;

creating performance indicators for each element of value using at least a portion of the data,

using genetic algorithms to evolve neural network models of historical and forecast data for one or more aspects of financial performance using said performance indicators to identify value driver candidates by element of value,

analyzing historical and forecast data for one or more aspects of financial performance using causal models and said value driver candidates to identify value drivers and create element impact summaries where said element impact summaries are useful in analyzing, modeling and optimizing aspects of enterprise financial performance and completing element valuations.

Cited references: See cited references for claims 65, 66 and 67 and cited references for claim 35

What's missing:

1) aggregating enterprise related transaction data from one or more enterprise management systems by element of value in accordance with a common data dictionary;

2) creating performance indicators for each element of value using at least a portion of the data,

3) using genetic algorithms to evolve neural network models of historical and forecast data for one or more aspects of financial performance using said performance indicators to identify value driver candidates by element of value, and

4) analyzing historical and forecast data for one or more aspects of financial performance using causal models and said value driver candidates to identify value drivers and create element impact summaries where said element impact summaries are useful in analyzing, modeling and optimizing aspects of enterprise financial performance and completing element valuations.

Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 48.

49. (new) The computer readable medium of claim 48 that further comprises using the element impact summaries to create network models of one or more aspects of enterprise financial performance that can support the optimization of enterprise financial performance by identifying one ore value driver changes.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) using the element impact summaries to create network models of one or more aspects of enterprise financial performance that can support the optimization of enterprise financial performance by identifying one ore value driver changes.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 49.

50. (new) The computer readable medium of claim 48 where the elements of value are selected from the group consisting of brands, customers, employees, intellectual capital, partners, vendors, vendor relationships and combinations thereof.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) elements of value are selected from the group consisting of brands, customers, employees, intellectual capital, partners, vendors, vendor relationships and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 50.

51. (new) The computer readable medium of claim 48 where the aspects of enterprise financial performance are selected from the group consisting of revenue, expense, capital change, cash flow, market sentiment value, market value, current operation value and combinations thereof.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) aspects of enterprise financial performance are selected from the group consisting of capital change, cash flow, market sentiment value, current operation value and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 51.

52. (new) The computer readable medium of claim 48 where enterprise management systems are selected from the group consisting of advanced financial systems, basic financial systems, operation management systems, sales management systems, human resource systems, accounts receivable systems, accounts payable systems, capital asset systems, inventory systems, invoicing systems, payroll systems, purchasing systems and combinations thereof.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) enterprise management systems are selected from the group consisting of advanced financial systems, basic financial systems, operation management systems, sales management systems, human resource systems, accounts receivable systems, accounts payable systems, capital asset systems, inventory systems, invoicing systems, payroll systems, purchasing systems and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 52.

53. (new) The computer readable medium of claim 48 where the element impact summaries are comprised of indicators selected from the group consisting of numeric data, date data, trends, ratios, averages, patterns, time lagged numeric data, time lagged date data, time lagged trends, time lagged ratios, time lagged averages, time lagged patterns and combinations thereof.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) element impact summaries that are comprised of indicators selected from the group consisting of numeric data, date data, trends, ratios, averages, patterns, time lagged numeric data, time lagged date data, time lagged trends, time lagged ratios, time lagged averages, time lagged patterns and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 53.

54. (new) The computer readable medium of claim 53 where the element impact summary values are at least in part a function of the inter-relationship between the value drivers.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) element impact summary values that are at least in part a function of the inter-relationship between the value drivers.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 54.

55. (new) The computer readable medium of claim 48 where the causal models are selected from the group consisting of entropy minimization, LaGrange and path analysis.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) causal models that are selected from the group consisting of entropy minimization, LaGrange and path analysis.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 55.

56. (new) The computer readable medium of claim 49 where the models of enterprise financial performance produce usable forecasts without the use of a separate system.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 49, and 2) models of enterprise financial performance that produce usable forecasts without the use of a separate system.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 56.

57. (new) The computer readable medium of claim 48 where a transaction is any event that is logged or recorded.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) transactions that comprise any event that is logged or recorded.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 57.

58. (new) The computer readable medium of claim 49 where a Markov Chain Monte Carlo model is used to identify the changes that will optimize one aspect of enterprise financial performance, genetic algorithms are used to identify changes that will optimize one or more aspects of enterprise financial performance or multi-criteria optimization models are used to identify the changes that will optimize two or more aspects of enterprise financial performance.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 49, and 2) Markov Chain Monte Carlo model being used to identify the changes that will optimize one aspect of enterprise financial performance, genetic algorithms being used to identify changes that will optimize one or more aspects of enterprise financial performance or multi-criteria optimization models being used to identify the changes that will optimize two or more aspects of enterprise financial performance.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 58.

59. (new) The computer readable medium of claim 48 where value drivers are factors that have an effect on elements of value, intellectual capital, aspects of enterprise financial performance and combinations thereof.
Cited references: See cited references for claim 48
What's missing: 1) see what's missing from claim 48, and 2) value drivers are factors that have an effect on elements of value and intellectual capital.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 59.

60. (new) An apparatus, comprising: enterprise transaction systems, means for aggregating data from said systems in accordance with a common data dictionary, means for analyzing at least a portion of the data to identify performance indicators that are causal to change in aspects of financial performance by element of value where the elements of value are selected from the group consisting of brands, customers, customer relationships, employees, intellectual capital, partnerships, production equipment, vendors, vendor relationships and combinations thereof, means for using said causal indicators to create summaries of element impact on aspects of enterprise financial performance where the aspects of enterprise financial performance are selected from the group consisting of revenue, expense, capital change, cash flow, market sentiment value, intellectual capital value, market value, current operation value and combinations thereof, means for using said impact summaries to create network models of one or more aspects of enterprise financial performance, and means for using said models to identify changes that will optimize one or more aspects of enterprise financial performance.
Cited references: See cited references for claims 35
What's missing: 1) enterprise transaction systems, 2) means for aggregating data from said systems in accordance with a common data dictionary, 3) means for analyzing at least a portion of the data to identify performance indicators that are causal to change in aspects of financial performance by element of value where the elements of value are selected from the group consisting of brands, customers, customer relationships, employees, intellectual capital, partnerships, production equipment, vendors, vendor relationships and combinations thereof, 4) means for using said causal indicators to create summaries of element impact on aspects of enterprise financial performance where the aspects of enterprise financial performance are selected from the group consisting of revenue, expense, capital change, cash flow, market sentiment value, intellectual capital value, market value, current operation value and combinations thereof,

5) means for using said impact summaries to create network models of one or more aspects of enterprise financial performance, and 6) means for using said models to identify changes that will optimize one or more aspects of enterprise financial performance.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 60.

61. (new) The apparatus of claim 60 where network models support the identification of transaction changes that will improve or optimize performance.
Cited references: See cited references for claim 60
What's missing: 1) see what's missing from claim 60, and 2) network models that support the identification of transaction changes that will improve or optimize performance.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 61.

62. (new) The apparatus of claim 60 where the summaries of impact by element are created using algorithms selected from the group consisting of entropy minimization, LaGrange and path analysis.
Cited references: See cited references for claim 60
What's missing: 1) see what's missing from claim 60, and 2) summaries of impact by element are created using algorithms selected from the group consisting of entropy minimization, LaGrange and path analysis.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 62.

63. (new) The apparatus of claim 60 where the element impact summaries are comprised of indicators selected from the group consisting of item values, trends, ratios, averages, patterns, time lagged item values, time lagged trends, time lagged ratios, time lagged averages, time lagged patterns and combinations thereof.
Cited references: See cited references for claim 60
What's missing: 1) see what's missing from claim 60, and 2) element impact summaries that are comprised of indicators selected from the group consisting of item values, trends, ratios, averages, patterns, time lagged item values, time lagged trends, time lagged ratios, time lagged averages, time lagged patterns and combinations thereof.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 63.

64. (new) The apparatus of claim 60 where an enterprise is a single product, a group of products, a division or a company.
Cited references: See cited references for claim 60
What's missing: 1) see what's missing from claim 60, and 2) an enterprise is a single product, a group of products, a division or a company.
Conclusion: The cited references can not be combined, modified or used to describe, anticipate or make obvious claim 64.

Another way in which the 16 November 2004 office action fails to establish a prima facie case of obviousness is that it does not provide any evidence indicating that there was any suggestion, teaching or motivation in the prior art to modify or combine the teachings of Bielinski and Brown. When determining obviousness, "a showing of a suggestion, teaching or motivation to combine prior art references is an essential component of an obviousness holding'" (In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)). As noted previously, the Applicant has been unable to find support in the cited references for virtually all of the statements used to support these rejections.

Other ways in which all of the § 103 (a) obviousness rejections in the 16 November 2004 office action can be traversed include:

1) noting that the references teach away from the theoretical combination proposed in the office action in a number of ways and MPEP § 2145 X.D.2 provides that: "it is improper to combine references where the references teach away from their combination",
2) noting that the office action fails to teach how a value based management system and neural networks would be combined to produce anything useful as it is well known that "particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed" (In re Kotzab, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). In other words, the Examiner has not described the manner in which the references would be combined or the reason(s) for doing so; and
3) noting that the office action fails to describe, anticipate or make obvious the invention as a whole as required by MPEP 2141.

The Applicant also notes that there are still other ways in which all of the § 103 rejections in the 16 November 2004 office action can be traversed.

35 U.S.C. § 101 Rejection of Claim

In the 16 November 2004 office action, claims 65 through 68 are rejected under 35 U.S.C. § 101 as being unpatentable given the Examiner's opinion that the claims are directed to non-statutory subject matter. More specifically, the Examiner presents a two prong test for identifying statutory subject matter and offers an unsupported opinion that the cited claims fail to meet both prongs of this test. The first prong of this test is a technological arts requirement that lacks the support of precedent. The second prong of the test is a requirement that the method produce results that are tangible (i.e. not disembodied from the physical world), concrete (i.e. assured or reproducible) and useful (i.e. have practical utility or real world value).

The Applicant traverses the § 101 rejections for claim 65 and its dependent claims 66 and 67 based on the first prong of the test in three ways. First, by noting that the rejection is based one step in a multi step process – in doing this the Examiner has failed to consider the invention as a whole in accordance with the guidance of MPEP 2106 A. Second, by noting that this step supports subsequent stages of processing. Third, by noting that the office action does not contain any evidence that the processing described for the data aggregation in accordance with a common data dictionary step (or any other step) does not require the use of a computer. Under the Administrative Procedures Act (5 U.S.C. §706(2)) actions, findings and conclusions by government agencies require the support of substantial evidence to be lawful. Given the foregoing, the Applicant also notes that this rejection appears to be inconsistent with PTO policy as it was explained at the April Business Process partnership meeting that discussed, among other things, this new test that lacks the support of precedent.

The Applicant traverses all § 101 rejections for claim 65 and its dependent claims 66 and 67 based on the second prong of the test in two ways. First, by noting that the rejected claims each describe methods, systems and/or media for transforming data into results that are tangible (they concern physical entities like brands, customers, employees, partners, production equipment, vendors and vendor relationships), concrete (reproducible) and useful (they support the analysis, management and optimization of real world business performance and real world business value). Second, by noting that the rejection is arbitrary and capricious because the office action does not contain any evidence that the clamed invention is not tangible, concrete and/or useful. Under the Administrative Procedures Act (5

U.S.C. §706(2)) actions, findings and conclusions by government agencies require the support of substantial evidence to be lawful.. In making this arbitrary determination the Examiner has also ignored teachings from current and previously provided references regarding the usefulness of the claimed invention.

The Applicant traverses the § 101 rejections for claim 68 based on the first prong of the test by noting that the office action does not contain any evidence that the processing completed by the system described in the claim does not require the use of a computer. It is well established that substantial evidence is required to support decisions made by the U.S.P.T.O. (In re Gartside 203F.3d 1305, 53 USPQ2d 1769 (Fed Circuit 2000)). At the same time, the Examiner has provided ample evidence that a computer is required for the effective analysis of the multiplicity of factors that affect real world business performance.

The Applicant traverses all § 101 rejections for claim 68 on the second prong of the test in two ways. First, by noting that the rejected claim describes a system for transforming data into results that are tangible (they concern physical entities like brands, customers, employees, partners, production equipment, vendors and vendor relationships), concrete (reproducible) and useful (they support the analysis, management and optimization of real world business performance and real world business value). Second, by noting that the rejection is arbitrary and capricious because the office action does not contain any evidence that the clamed invention is not tangible, concrete and/or useful. Under the Administrative Procedures Act (5 U.S.C. §706(2)) actions, findings and conclusions by government agencies require the support of substantial evidence to be lawful.. In making this arbitrary determination the Examiner has also ignored teachings from current and previously provided references regarding the usefulness of the claimed invention.

35 U.S.C. § 112 Claim Rejection

The cancellation of claim 68 makes the § 112 rejection of this claim moot.

Information Disclosure Statement

Pursuant to 37 CFR 1.97 and 1.98, the references listed on the enclosed Form PTO - 1449 and/or Substitute Form PTO - 1449 ("Form 1449") are submitted for consideration by the Examiner in the examination of the instant patent application. The Applicant also notes that references describing neural networks and VBM were considered in reviewing both the parent and grandparent of the instant application. The documents listed on the Form 1449 have previously been provided for parent application 08/999,245. The Form PTO - 1449 submitted with this office action updates the references submitted with the reply to the 5 May office action. The Applicant notes that the previously provided information disclosure statement was not initialed and returned with the 16 November 2004 office action.

The full consideration of the references in their entirety by the Examiner is respectfully requested and encouraged. Also, it is respectfully requested that the references be entered into the record of the present application and that the Examiner place his or her initials in the appropriate area on the enclosed Form 1449, thereby indicating the Examiner's consideration of each of the references.

The submission of the references listed on the Form 1449 is for the purpose of providing a complete record and is not a concession that the references listed thereon are prior art to the invention claimed in the patent application. The right is expressly reserved to establish an invention date earlier than the above - identified filing date in order to remove any reference submitted herewith as prior art should it be deemed appropriate to do so.

Further, the submission of the references is not to be taken as a concession that any reference represents art that is relevant or analogous to the claimed invention. Accordingly, the right to argue that any reference is not properly within the scope of prior art relevant to an examination of the claims in the above-identified application is also expressly reserved.

Reservation of Rights

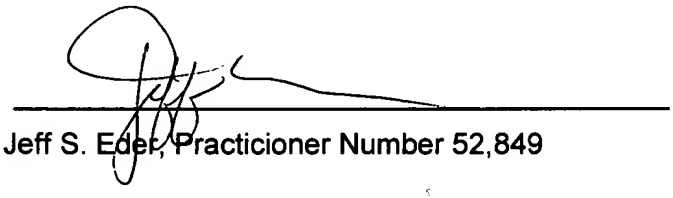
The Applicant hereby explicitly reserves the right to present the canceled and modified claims for re-examination in their original format. The cancellation and modification of the pending claims to put the instant application in a final form for allowance and issue is not to be construed as a surrender of subject matters covered by the original claims before their modification or cancellation.

Summary/Conclusion

The Applicant respectfully requests consideration of the present application as amended herewith.

Respectfully submitted,

Dated: 1/12/2004



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